Appendix F
Glossary

The following symbols and notations are used throughout the EP.

a_g Maximum ground acceleration, ft/sec^2

C Velocity of pressure waves in water, 4,720 ft/sec

C_r Velocity of pressure waves in the foundation

CQC Complete quadratic combination method for combining the modal responses in a response spectrum analysis

DTS Dynamic tensile strength which accounts for an increase in strength due to the high strain rate loading associated with earthquake ground motion

E_f Young's modulus of elasticity of foundation rock

E_s Young's modulus of elasticity of dam concrete

f_1 Equivalent lateral force on the upstream face of the dam due to the fundamental vibration mode at a y-distance above the foundation

f_{sc} Equivalent lateral forces acting on dam due to higher vibration modes at a y-distance above the foundation

f_{r1} Fundamental resonant frequency of dam on flexible foundation rock with impounded water

f'_c Specified compressive strength of RCC, psi

f'_t Tensile strength of RCC based on direct tensile tests

f_t Tensile stress

$f_{t(allowable)}$ Allowable tensile stress defining an acceptable response

F_{st} Hydrostatic force of the forebay acting on the upstream face of the dam

g Acceleration due to gravity, 32.2 ft/sec^2

H Depth of forebay pool above the foundation

H_s Height of upstream face of dam

L_1 Generalized earthquake force coefficient for the empty reservoir condition

$\tilde{L}_1$ Generalized earthquake force coefficient for the loading condition with the reservoir at depth H

M_1 Generalized mass for the empty reservoir condition

$\tilde{M}_1$ Generalized mass for the loading condition with the reservoir at depth H

MCE Maximum credible earthquake which is the most severe earthquake believed possible at a site

OBE Operating basis earthquake which is the earthquake with a 50% chance of exceedence during the 100-year life of the dam

$\bar{p}$ Standard value of the hydrodynamic pressure function associated with the fundamental vibration mode for the full reservoir condition (H/H_s = 1), and at a y-distance above the foundation

p Hydrodynamic pressure function associated with the fundamental vibration mode for the load condition with the reservoir at depth H, and at a y-distance above the foundation

$\bar{p}_o$ Standard value of the hydrodynamic pressure function associated with the higher modes for the full reservoir condition (H/H_s = 1), and at a y-distance above the foundation

p_o Hydrodynamic pressure function associated with the higher modes for the loading condition with the reservoir at depth H, and at a y-distance above the foundation

PGA Peak Ground Acceleration for the OBE or MCE as appropriate

r_1 Maximum response (usually expressed as a stress at a y-distance above the foundation) due to the fundamental vibration mode

r_d Maximum dynamic response (usually expressed as a stress at a y-distance above the foundation)

r_{max} Maximum total response including both the maximum dynamic response and the summation of the responses due to initial static effects (ususally expressed as a stress at a y-distance above the foundation)

r_{sc} Maximum response due to the higher vibration modes (usually expressed as a stress at a y-distance above the foundation)

r_{st} Response due to an initial static effect such as the weight of the dam or the static water pressure which exists just before the earthquake event (usually expressed as a stress at a y-distance above the foundation)

RCC Roller compacted concrete

R_f Period lengthening ratio due to foundation-rock flexibility effects

R_r Period lenghtening ratio due to hydrodynamic effects

R_w Ratio of the fundamental vibration period of impounded water to the fundamental resonant period of the dam on a rigid foundation with impounded water

S_a Ordinate of acceleration from the design response spectrum normalized to a maximum ground acceleration of 1 g evaluated at period $\tilde{T}_1$ and damping ratio $\tilde{\varepsilon}_1$

$\tilde{S}_a$ The spectral acceleration obtained by scaling S_a by the peak gound acceleration (PGA) for either the OBE or MCE as appropriate

SRSS Square root of the sum of the squares method for combining the modal responses or out-of-phase components of the response in a response spectrum analysis

T_1 Fundamental vibration period of dam on rigid foundation rock with empty reservoir

$\tilde{T}_1$ Fundamental resonant period of dam on flexible foundation rock with impounded water

T_1^r Fundamental vibration period of impounded water (4H/C)

$\tilde{T}_r$ Fundamental resonant period of dam on rigid foundation rock with impounded water

$\tilde{T}_f$ Fundamental resonant period of dam on flexible foundation with empty reservoir

w Unit weight of water

w_c Unit weight of concrete (usually taken as 0.15 kips/ft^3)

w_s Weight of dam per unit height at a location y-distance above the foundation (base width x w_c)

y Coordinate along the height of the dam

α Wave reflection coefficient

β Percent of critical damping associated with a response spectrum

ε_1 Damping ratio of dam on rigid foundation rock with empty reservoir

$\tilde{\varepsilon}_1$ Effective damping factor for dam on flexible foundation rock with impounded water

ε_f Added damping ratio due to foundation-rock flexibility effects

ε_r Added damping ratio due to hydrodynamic effects

n_f Constant hysteretic damping factor for the foundation rock

ρ Mass density of water

ρ_r Mass density of the foundation rock

ϕ,Ψ Normalized fundamental vibration mode shape of dam at upstream face

ω_1 Fundamental frequency of the dam on rigid foundation rock with empty reservoir

ω_1^r Fundamental frequency of the impounded water idealized by a fluid domain of constant depth and infinite length

Ω Significance parameter for water compressibility